

Amendments to the Drawings

The attached sheets of drawings will replace all prior versions of the drawings in the Application. The sheets include changes to Fig. 5. Applicant has amended Fig. 5 to reflect Extension A and Extension B that is referred to in claims 38 and 39. This Amendment does not introduce new matter.

REMARKS/ARGUMENTS

This Amendment is submitted in response to the Office Action mailed on April 18, 2006. Claims 2 - 9, 11 - 17, 27 - 29, and 35 - 39 are pending, and all stand rejected at present.

On page 2 of the Office Action, the Examiner objected to the drawings under 37 C.F.R. §1.83(a). Applicant is herewith submitting corrected drawing sheets and believes these drawings are now in good form.

On page 3 of the Office Action, the Examiner objected to claim 11 under 35 U.S.C. §102 as having no antecedent basis for "mid-phase reluctance" in the specification. Applicant respectfully points out that a discussion entitled "Additional Considerations" occurs at the end of the Specification. In "Additional Consideration" number 1, which begins with the phrase "One view of the invention is that . . .", the passage "mid-phase reluctance" is explained.

RESPONSE TO 102 - REJECTIONS BASED ON HSU

On page 3 of the Office Action, the Examiner rejected claims 2 - 9 and 11 - 17 under 35 U.S.C. § 102(e) as being anticipated by Hsu.

Applicant has amended claim 2 to read as follows:

An electric motor, comprising:

- a) a pair of stator teeth, having a stator slot therebetween, said stator slot having a slot opening which faces a rotor in the motor, which rotor rotates about an axis; and
- b) means for increasing magnetic flux passing through the slot opening,
wherein the means comprises a body which is located radially outward of the slot opening and

located farther from said axis than the slot opening.

In view of claim 1 as now presented, and for the following reasons, Applicant believes that independent claim 1 not anticipated by Hsu.

Point 1

On page 4 of the Office Action, page 4, the Examiner provides a drawing which explains its interpretation of claim 2. However, Applicant points out that this interpretation is non-conventional, and inconsistent with standard engineering terminology.

Claim 2 states that the "means" is "radially outward of the slot opening." "Radially outward" means farther from the center from which the "radius" extends. The drawing in the Office Action interprets "radially outward" in the opposite sense.

Claim 2 has been amended to further focus the claim and distinguish it over the cited references, but this amendment is seen as redundant, in view of the fact that the amendment merely sets forth standard engineering terminology.

Point 2

Again, claim 2 recites that the "means" is "radially outward of the slot opening." The Office Action's drawing labels a supposed "slot opening." However, there is no "slot opening" at that location.

The stator elements in the drawing can be described as resembling human feet, in side view. APPENDIX A, attached, contains four sketches. In SKETCH 1, a "heel" and "toes" are designated. The only possible "slot opening" present is between the "toes" of one "foot" and the "heel" of the adjacent "foot," as indicated.

Given that fact (of what is the only possible "slot opening"), there is no "means" in the PTO's drawing which is "radially outward of" that "opening."

Further, as explained above, even if the "slot opening" identified in the Office

Action's drawing qualifies as a valid opening (which is not the case), the "means" in the PTO's drawing is not "radially outward" as claimed. The "means" is radially inward. That is opposite to the claim language.

Point 3

Claim 2 states: "the stator slot having a slot opening which faces a rotor." The "slot opening" labeled in the Office Action's drawing does not "face a rotor." In the PTO's drawing, the rotor is below the item labeled "means." The PTO's supposed "slot opening" does not "face" that rotor.

Point 4

Claim 2 recites:

- b) means for increasing magnetic flux passing through the slot opening.

The Office Action has not demonstrated that the "means" in its drawing increases any magnetic flux passing through its supposed "slot opening."

The Office Action is plainly relying on the Doctrine of Inherency. MPEP § 2112 states:

**IV. EXAMINER MUST PROVIDE RATIONALE OR EVIDENCE
TENDING TO SHOW INHERENCY.**

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.

In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teaching of the applied prior art.

The Office Action has not shown a "basis in fact and/or technical reasoning" as required by this MPEP section.

The Office Action, (page 3) does assert that "the portion end of the tooth holder which is reserved . . . [collects] the magnetic flux passing through the slot opening." This "portion end" is apparently referring to what Applicant calls the "toes" in the drawing.

However, this assertion fails to demonstrate any increase in magnetic flux crossing the dashed line in the drawing, which the PTO defines as spanning the supposed "slot opening."

Point 5

Applicant points out that the PTO's assertion is contrary to the laws of magnetic circuits, as understood by the undersigned attorney. The stator teeth (i.e., the foot-leg combinations) in the drawing are made of iron. Iron acts as a short circuit for magnetic fields. That is, magnetic fields preferentially flow through iron, rather than air.

Sketches 2 and 3, in APPENDIX A, attached, illustrate this point. In SKETCH 2, if a current (not shown) passes through the COIL, magnetic field lines, labeled B-FIELD, are produced. They preferentially travel through the iron bar, as indicated.

If that iron bar is re-shaped, into Hsu's configuration, as in SKETCH 3, then the B-FIELD lines travel as indicated. They remain confined within the iron bar, but spread out along the "sole" of the "foot."

The PTO has presented no rationale explaining why the B-FIELD lines should escape the iron bar, and pass through the item labeled PTO's SLOT OPENING in SKETCH 3. And, as stated above, that would be contrary to the laws of magnetic circuits. Magnetic fields prefer to travel through iron, as opposed to air.

Point 6

The operation of Hsu's device is actually contrary to what claim 2 recites.

As shown in SKETCH 2, APPENDIX A, some fringing fields F will be present. In Hsu's configuration, some fringing fields will also be present within the circle C in SKETCH 4.

However, the latter fringing fields will be smaller than those of SKETCH 2. A primary reason is that the size of the fringing field depends on the magnetic flux density (i.e., number of B-field lines per square inch).

In SKETCH 3, the magnetic flux density at the fringing location is larger, compared to the magnetic flux density in SKETCH 4 at the fringing location. The reason is that, in SKETCH 4, the same number of flux lines are spread out over a larger area, namely, over the "sole" of the "foot."

Therefore, the amount of fringing in Hsu's device is smaller than in SKETCH 2. Consequently, the amount of flux within the slot opening of Hsu's device (labeled in SKETCH 1) is less than the amount in SKETCH 2. Thus, if Hsu's "foot" is added to SKETCH 2, the flux within the slot opening (SKETCH 1) is reduced.

That reduction is opposite to what is claimed.

Conclusion

The preceding six points demonstrate that claim 2 does not read on the Hsu reference.

Other Claims

The discussion above applies to the other claims in this group.

Claims 11 and 12

The Office Action, page 6, mis-applies the claim language.

Point 1

Claim 11 recites a "central axis" which is "non-radial."

The Office Action finds a central axis in its drawing on page 6. However, Applicant points out that this supposed central axis is not a straight line. The word "axis" is related to the word "axle," and implies a reference line about which something can rotate. The crooked line in the PTO's drawing cannot qualify as such an axis.

Point 2

Independent of Point 1, Applicant points out that the PTO is applying the terms of the claim to a situation in which the terms are inapplicable.

The crooked line in the PTO's drawing can never be "radial." That crooked line can never lie along a "radius."

This shows that the PTO is applying the terms "central axis" and "non-radial" to a situation which is irrelevant.

Stated another way, if the PTO's crooked line qualifies as a "central axis" which is "non-radial," then a situation must be possible wherein that crooked line qualifies as the opposite, namely, as a "central axis" which IS "RADIAL."

Applicant submits that the latter is impossible.

Therefore, the claim terms "central axis" which is "non-radial" are simply inapplicable to the situation shown in the PTO's drawing.

Point 3

Claim 11 has been amended to state that the axis is "straight."

Point 4

The crooked line of the PTO's drawing does not correspond to the claimed "central axis." The claim recites "a slot having a straight central axis." The crooked axis in the PTO's drawing is not an axis of a "slot." It is a mid-line of the space between the tips of two stator teeth.

Claims 13 - 16

Claim 13 has been amended. It now reads:

In an electric motor having a rotor, the improvement comprising:

- a) stator teeth, and
- b) a non-radial slot opening separating neighboring stator teeth, which slot opening has two flat walls extending along its length, which walls comprise flat surfaces on said teeth.

This amendment is seen as non-necessary. The PTO's drawing (page 7 of Office Action) shows a slot opening which separates part of neighboring teeth.

The preceding point applies to dependent claims 14 - 16.

Claim 17

Claim 17 has been amended to state that the "walls" extend along the length of the slot. Hsu does not show that.

On page 7 of the Office Action, the Examiner rejected claims 27-29 and 35-39 under 35 U.S.C. §102(e) as being anticipated by Nutter. In view of the claims as now presented, and for all the reasons discussed below, Applicant believes that these claims are not anticipated by Nutter.

Claim 27

Claim 27 has been amended to state that the first and second teeth are surrounded by similar coils. That is impossible in Nutter, because the supposed second stator tooth is, in fact, part of the first tooth.

Claims 28 and 29

An amendment to claim 28 states that the first stator tooth and the adjacent stator tooth have certain similar properties. Those properties are not shown in the PTO's drawings.

This applies to dependent claim 29.

Claims 35 - 38

Amendments state that similar coils surround the teeth. That situation is impossible under the PTO's interpretation of Nutter.

General Comment

Applicant submits that the PTO is applying a non-conventional definition of the term "stator tooth." For example, the PTO asserts that the split tooth of Nutter actually shows two teeth.

Rather than argue this point, Applicant has amended the claims to state that the teeth carry similar coils. The two supposed teeth in Nutter do not do that.

For all the foregoing reasons and in view of the claims as now presented, Applicant believes this case is now in condition for allowance and such allowance is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees under 37 C.F.R. 1.16 and 1.17 which may be required by this paper, or to credit any overpayment, to **Deposit Account No. 50-1287**. Applicants hereby provide a general

request for any extension of time which may be required at any time during the prosecution of the application. The Commissioner is also authorized to charge any fees which have not been previously paid for by check and which are required during the prosecution of this application to **Deposit Account No. 50-1287**. (Should Deposit Account No. 50-1287 be deficient, please charge any further deficiencies to Deposit Account No. 10-0220.)

Applicant is filing concurrently under separate cover a request for a one month extension of time.

Applicant invites the Examiner to contact the undersigned via telephone with any questions or comments regarding this case. **Applicant respectfully requests an interview with the Examiner if this Amendment does not place this case in condition for allowance.**

Reconsideration and favorable action are respectfully requested.

Respectfully submitted,

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